

REMARKS

1 1. The First Office Action of November 01, 2007 is hereby acknowledged. The
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3 shortened statutory period of three (3) months time period for response to the Office Action
4 expires on February 1, 2008. This Amendment is being mailed by United States Express
5 Mail, Express Mail Label No. EM 187727211US in a postage paid envelope addressed to
6 Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on January 22,
7 2008. Therefore, this amendment is timely filed and there is no filing fee which is due. In
8 the event that the Commissioner for Patents should determine that any additional fee is
9 required for this Amendment to be timely filed and an appropriate fee is due for that
10 extension of time, then the Commissioner for Patents is hereby authorized to charge Deposit
11 Account Number 18-2222 for such appropriate fee.
12

13
14 2. The original '101 Application had a total of 22 claims wherein one was an
15 independent claim. Through the last Preliminary Amendment dated August 06, 2006, the
16 '101 Application had 21 total claims with one independent claim. The '101 Application
17 contains the same number of claims after this Amendment. Accordingly, no additional filing
18 fee is due. In the event that the Commissioner for Patents should determine that any
19 additional fee is due, then the Commissioner for Patents is hereby authorized to charge
20 Deposit Account Number 18-2222 for the appropriate fee.
21

22 3. The Patent Examiner's very detailed analysis of the '101 Application is
23 acknowledged with appreciation. However, the Applicants respectfully disagree with the
24 Examiner's rejection of the '101 Application. The Applicants will first address the rejection
25 of Claim 1, since Claim 1 is the only independent claim and the rest of the claims of the '101
26 Application all depend on it.
27

28 The Examiner is rejecting Claim 1 under 35 U.S.C. 103 (a) as being obvious in

1 view of United States Patent No.: 4,126,451 issued to Nayar for "Manufacture Of Plates By
2 Powder-Metallurgy" (hereafter the "Nayar Patent"). After carefully reviewing the Nayar
3 Patent, the Applicants respectfully disagree with the rejection since the '101 Application is
4 technically and structurally different from the Nayar Patent, particularly from the frame
5 structure having characters of the "thin skin" and "boxed" shape. The Applicants will
6 illustrate their structural differences in Section 5 of this Amendment.

7
8 However, in order to further differentiate the '101 Application from the Nayar Patent,
9 the Applicants have amended steps "b" and "d", including addition of a new step "d" of
10 Claim 1, where the newly amended Claim 1 through this Amendment is presented in Section
11 5. Therefore, the amended Claim 1 is now more particularly and distinctly defined so as to
12 overcome the rejection of the cited Nayar Patent. The Applicants will discuss why the
13 presently amended Claim 1 and the rest of the claims of the '101 Application are patentable
14 in Sections 5 and 6 respectively.

15
16 4. Through this Amendment the Applicants have amended the steps "b" and "d"
17 in addition to add a new step "e" so that they now read:

- 18 "b. loading said powder mixture into a metal frame being a box to form a framed
19 mixture, further comprising compacting said framed mixture to form a framed
20 compact having 50% to 95% of the theoretical density;
21 d. rolling said framed-billet to form said framed-metal-matrix-composite-
22 plate/sheet without edge cracks, wherein said plate/sheet is comprised of thin
23 skins of said frame metal which encapsulate said metal-matrix-composite as a
24 thick core;
25 e. said method results in a high sheet yield rate for producing said framed-metal-
26 matrix-composite-plate/sheet."

1 The Applicants believe that the amendment of Claim 1 is allowable since it is
2 supported by the disclosure in the '101 Application.

3
4 Regarding the amended step "b", a new claim limitation "being a box" has
5 been added to modify the claimed "frame". The limitation "being a box" is supported by the
6 disclosure in the specification, as "All sides of the MMC billet can be framed to form an
7 encapsulating box-framed MMC billet for rolling as well" (Page 8, lines 1 and 2).

8
9 In terms of the amended step "d", a new limitation has been added: "which
10 encapsulate said metal-matrix-composite as a thick core", which modifies the previously
11 defined limitation "thin skins of said frame metal". The added limitation is supported by the
12 disclosure of the '101 Application: "All sides of the MMC billet can be framed to form an
13 encapsulating box-framed MMC billet for rolling as well. The box-framed MMC billet is
14 rolled to produce a sandwich structure sheet that has thin skins of said frame metal and a
15 MMC core that is about 100% theoretical density" (Page 8, lines 1-4).

16
17 As to the added step "e", it is supported by the disclosure "The main
18 advantage of the present invention is that the sheet yield rate from MMC billet, according to
19 the present invention method, is approximately 80 to 100% compared to 30 to 60% in prior-
20 art manufacturing methods" (Page 5, lines 25 to 27).

21
22 In conclusion, the above illustration demonstrates that the amendment of
23 Claim 1, including modification of the steps "b" and "d" and addition of the step "e" are
24 based on the specification of the "101 Application, which was filed on November 18, 2003,
25 and the amendment does not introduce new matter. Therefore, this Amendment is in
26 compliance with 35 U.S.C. 112, and the amended Claim 1 is allowable.

27
28 5. The Applicants will now provide an analysis as to why the amended Claim 1

is patentable over the Nayar Patent under 35 U.S.C. § 102 . In the analysis, the Applicants will first point out the structural differences between the amended steps “b” and “d” of Claim 1 of the ‘101 Application and the Nayar Patent in the following Table 1.

Table 1 The structural differences between the amended steps “b” and “d” of Claim 1 of the ‘101 Application and the Nayar Patent

The ‘101 Application, Claim 1	the Nayar Patent
<p>“b. loading said powder mixture into a metal frame being a box to form a framed mixture, further comprising compacting said framed mixture to form a framed compact having 50% to 95% of the theoretical density;</p> <p>“d. rolling said framed-billet to form said framed-metal-matrix-composite-plate/sheet without edge cracks, wherein said plate/sheet is comprised of thin skins of said frame metal which encapsulate said metal-matrix-composite as a thicker core.”</p>	<p>“Layer 15 is a dense layer of the consolidated chromium or chromium-alloy powder and layer 14 is a backing layer which is derived from a stainless steel punch” (Col. 8, lines 30-32, and in Figure 5), where both layer 14 and layer 15 are placed inside of a cavity 2 of a die 1 (see Figure 1).</p> <p>“FIG. 6 shows a sectional view of an alternative composite product which includes an intermediate layer 16 between backing layer 14 and consolidate powder layer 15” (Col. 8, lines 35-38, and in Figure 6), and “layer 14 is a backing layer which is derived from a stainless steel punch” (Col. 8, lines 31-32).</p>

It is clear that as illustrated in Table 1 the step “b” of Claim 1 states the mixture of the powder which is encapsulated by the frame metal in the shape of a box. The structure of the box shaped metal frame of the ‘101 Application is new and not anticipated by the Nayar Patent, where the Patent discloses a flat “layer 14” as the “backing layer” derived from a stainless steel punch to support powdered metal.

In fact, a meaning of the frame is commonly agreed to be “*something composed of parts fitted together and united*” (Webster’s Ninth New Collegiate Dictionary). Therefore, the layer 14 of the Nayar Patent cannot be considered as the frame. For this reason, the inventor Nayar never discloses the backing layer 14 as the frame of the metal powder. Therefore, the produced sheets/plates are structurally different from the Nayar Patent and the ‘101 Application.

From the structural differences which are listed in the above Table 1, it is clear that the amended Claim 1 of the '101 Application teaches the different products, as compared with the products taught by the Nayar Patent. Therefore, the amended Claim 1 is patentable over the Nayar Patent. This conclusion is consistent with 35 U.S.C. § 102 and the following listed court interpretations on 35 U.S.C. § 102 according to the same product or process under the 35 U.S.C §102, particularly from “*If one prior art reference completely embodies the same process or product as any claim of the patent in suit, the process or product recited by the claim is said to be ‘anticipated’ by the prior art, and the claim is therefore invalid under 102 for want of novelty*”, *Shatterproof Glass Corp. v. Libbny-Owens Ford Co.* 225 USPQ 635, 644 (Page 637, the First Column), and from “*Invalidity for anticipation requests that all of the element and limitation of the claim are found with a single prior art reference*”, and “*there must be no difference between the claimed invention and reference disclosure, as viewed by a person of ordinary skill in the field of invention*”, *Scripps Clinic v. Genentech Inc.*, 18 USPQ2d, 1001, 1016 (Page 1010, the First column).

In addition, the amended Claim 1 of the '101 Application claims “said method results in a high sheet yield rate for producing said framed-metal-matrix-composite-plate/sheet”, which is also new and not anticipated by the Nayar Patent since it does not disclose what the yield rates are. In other words, the '101 Application possesses a property which is unknown to the Nayar Patent. Therefore, the conclusion that Claim 1 is patentable is consistent with the following listed court interpretations on patentability according to the “unknown properties”, particularly from “*Under the principles of inherency, if a structure in the prior art necessarily functions in accordance with the limitations of a process or method claim of an application, the claim is anticipated. This is not to say that the discovery of a new use for an old structure based on unknown properties of the structure might not be patentable to the discovery as process*”, *In re King*, 231 USPQ 136.

1 Therefore, the above illustration demonstrates the patentability of the '101
2 Application as claimed by Claim 1 over the Nayar Patent due to the differences of both
3 structure and property.

4
5 6. The Applicants further believe that the '101 Application as claimed by
6 Claim 1 is non-obvious in view of the Nayar Patent according to guidelines of MPEP: "*To*
7 *established prima facie obviousness of a claimed invention, all the claim limitation must be*
8 *taught or suggested by the prior art.*" *In re Poyka*, 180 USPQ 580; MPEP Rev. 3, August
9 2005, 2100-139, in addition to findings of the Board of the Patent Appeals and Interferences:
10 "*Our reviewing courts have often advised the Patent and Trademark Office that it can satisfy*
11 *the burden of establishing a prima facie case of obviousness only by showing some objective*
12 *teaching in either the prior art, or knowledge generally available to one of ordinary skill in*
13 *the art that 'would lead' that individual 'to combine the relevant teachings of the*
14 *references.*"...Accordingly, an examiner cannot establish obviousness by locating references
15 which describe various aspects of a patent applicant's invention without also providing
16 evidence of the motivating force which would impel one skilled in the art to do what the
17 patent applicant has done" *Ex parte Livengood*, 28 USPQ2d 1300.

18
19 It is clear that the Nayar Patent teaches using the backing layer 14 which is
20 positioned under the consolidated powder layer 15 (in addition to a possible intermediate
21 layer 16 which is positioned between the consolidated powder layer 15 and the backing layer
22 14), where all these layers are positioned in the cavity 2 of the die 1. However, the Nayar
23 Patent never teaches using a frame such as the box which can encapsulate the composites. In
24 contrast, the box has been taught by Claim 1 of the '101 Application. Therefore, the claimed
25 structural limitations of the Nayar Patent does not satisfy a rejection under 35 U.S.C. 103 to
26 Claim 1 of the '101 Application from the above cited guidelines of MPEP and findings of the
27 Board. In other words, the '101 Application as claimed by Claim 1 cannot be rejected in
28 accordance with 35 U.S.C. § 103.

1 The Applicants further disagree with the Examiner's findings listed in Section
2 6 of the Office Action, and the Examiner's rejection of Claim 1 of the '101 Application under
3 35 U.S.C. § 103, listed in Section 7 of the Office Action.

4
5 First, the Examiner concludes in his findings that "*Nayar discloses in Figure 2*
6 *and Table II (T_p vs. T_m ; wherein T_p is $[T_d - T_m]/2$) wherein the dimensions of the punch plates*
7 *(after rolling, T_p) are thicker or the same value as the pressed, inner powder layer (T_m after*
8 *rolling)*". Second, the Examiner second states his rejection based on his findings on the
9 related dimensions and an assumption that "*because it has been held that where the only*
10 *difference between the prior art and the claims was a recitation of relative dimensions of the*
11 *claimed device and a device having the claimed relative dimensions would not perform*
12 *differently than the prior art*" (Section 7, the First Office Action). In fact, both of the
13 Examiner's findings and assumption are not correct according to the respective disclosure of
14 the Nayar Patent and concepts of advantages of the metal-matrix composite materials over
15 the conventional plain metal materials.

16
17 The Applicants first illustrate a structural character of the Nayar Patent, which
18 consists of a "thin" core of the composites and a "thick" skin of the punch materials. For a
19 first example, the Nayar Patent discloses that the punch 4 was 0.75 inches in thickness (Table
20 I, Punch Parameters, Ex. 1A). When the powder is not compressed, its thickness, T_M , is
21 "0.75" inches (Table II, Example 1A from 0 pass). However, after passing one time during
22 the compression process, the thickness of the compressed powder served as the core
23 materials, T_M , is "0.5" inches (Table II, Example 1A from 1 pass), which is significantly less
24 than the thickness 0.75 inches of the punch which serves as the "skin" of the composite
25 materials.

26
27 As to a second example, the Nayar Patent discloses that the thickness T_M of
28 the powder layer of Example "1" in Table II changes from 0.563 inches to 0.263 inches in

1 accordance with change of the situation when the powder is not compressed to when the
2 powder is compressed by two passes. Therefore, it is certain that the punch as the "skin" is
3 much thicker (0.5 inches, Table I, Punch Parameters, EX. 1) than the compressed powder
4 (0.263 inches) as the core structure.

5
6 In fact, all the examples listed in Tables I and II consistently disclose the
7 structural character of the thick skin and thin core composite material for the Nayar Patent,
8 except for the only one Example 6, which is uncompleted or unsatisfied due to missing data
9 of the powder thickness.

10
11 Therefore, the structural character of the "thin skin and thick core" of the '101
12 Application is distinguishable, as compared with the above revealed structural character of
13 the "thick skin and thin core" of the Nayar Patent. Therefore, the conclusion is that there is
14 no overlap of dimensional ranges of the core composite materials between the Nayar Patent
15 and the '101 Application. This also leads to that the rejection of the '101 Application based
16 on the obviousness is not appropriate in accordance with rules of MPEP, 2144.05 I, Sectional
17 Title "OVERLAP OF RANGES", containing guidelines for rejection under 35U.S.C.103.

18
19 Furthermore, the structural character of having the "thick" core composites
20 determines superior properties of the framed-metal-matrix composite materials of the '101
21 Application, as compared with the Nayar composite materials having the "thick" plain metal
22 as the core structure. This is because that it is commonly agreed that the composite materials
23 have superior properties over the conventional plain metal structure materials. Therefore, it
24 is inappropriate for the Examiner's to state that: "*a device having the claimed relative*
25 *dimensions would not perform differently than the prior art*", where the statement logically
26 leads to the inappropriate rejection of the '101 Application in the First Office Action.

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1 In summary, the above analysis clearly shows that the '101 Application as
2 claimed in Claim 1 is patentable and overcomes the rejection under 35 U.S.C.103 in the First
3 Office Action. In addition, the Applicants have found that there is no Section MPEP 2144.05
4 IV, which was cited by the Examiner in Section 7 of the First Office Action.

5
6 7. The above illustration demonstrates the patentability of the independent Claim
7 1. Based on this conclusion, the rest of the claims of the '101 Patent including Claims 2-3,
8 and 5-22 are also patentable, since they are all dependent claims that depend on the allowable
9 Claim 1. Therefore, the claims all include the distinguishable limitations of step "b" as the
10 "*metal frame being a box*", step "d" as the "*thin skins of said frame metal which encapsulate*
11 "*said metal-matrix-composite as a thicker core*", and step "e" as the "*method results in a*
12 "*high sheet yield rate for produced framed-metal-matrix-composite-plate/sheet*" of Claim 1,
13 which makes them allowable over the prior art cited in the First Office Action. Specifically,
14 Claims 2, 3, 5, 7-15, and 17-21 are patentable over the Nayar Patent; and Claims 3 and 6 are
15 patentable over the combination of the Nayar and Lowrance Patent. Claims 6 and 22 are
16 patentable over the combination of the Nayar Patent and the Japanese Patent: JP61194101A.

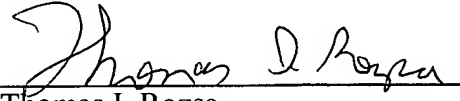
17
18 8. In conclusion, through this Amendment the Applicants have defined the
19 claims of the invention more particularly and distinctly so as to overcome the technique
20 rejection. Since the claims define a novel structure which is new and not anticipated by the
21 cited prior references, the Applicants submit that such claims are clearly patentable.

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1 9. Therefore, it is respectfully submitted that the present '101 Application is now
2 in condition for allowance and issuance of a Notice of Allowance of the '101 Application is
3 respectfully solicited.

4 Respectfully submitted,

5 Date: January 22, 2008

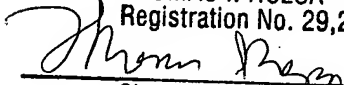
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